

**DISTRIBUTED BROADBAND CABLE MODEM TERMINATION SYSTEM****Abstract**

The distributed broadband cable modem termination system centralizes the point to multi-point function of the downstream signaling while simultaneously localizing the multi-point to single point functions of the upstream signaling. The upstream broadband cable termination segment of the broadband cable modem termination system is located at a different layer of the broadband cable network from the downstream broadband cable modem termination segment of the broadband cable modem termination system. By splitting the broadband cable modem termination system functions into separable and independently operable upstream and downstream functions, network deployment is optimized for a number of reasons. The downstream and upstream functions scale independently so the system can selectively add capacity where needed in the direction needed independent of the capacity in the reverse direction. In addition, this architecture provides additional flexibility by supporting a number of concurrently operational implementations. Within a single broadband cable network, the upstream and downstream segments of the broadband cable modem termination system can be located at different layers of the broadband cable network as long as the interconnected upstream and downstream segments of the broadband cable modem termination system for a particular communication path are at different levels of the broadband cable network.